

1.0 - Fractions Review

Name: *Notes Key*  
Date:

Goal: to review some key fractions skills in preparation for the upcoming unit

Toolkit:

- Working with integers
- Operations with fractions
- Reduce:  $\div$  num/den by same #
- $+/-$ : need common den. leave bottoms
- $\div$ :  $\times$  flip second fraction then
- $\times$ : multiply top, bottom
- reduce everything

Main Ideas:

Reducing Fractions

To reduce fractions:

Find a whole number that divides the numerator (top) and the denominator (bottom).

Reduce  $\frac{2}{4} \div 2 = \frac{1}{2}$

Ex1)

Ex1) Put each fraction in lowest terms (a.k.a. reduce the fractions).

a)  $\frac{9 \div 3}{12 \div 3}$

$\frac{3}{4}$

b)  $\frac{-6 \div 6}{18 \div 6}$

$\frac{-1}{3}$

c)  $\frac{35 \div 7}{49 \div 7}$

$\frac{-5}{7}$

Handy: make neg sign to top of fraction

d)  $\frac{200}{1000}$  keep reducing!

$\frac{2}{10} \div 2 = \frac{1}{5}$

Adding & Subtracting Fractions

- 1) To add or subtract fractions, you need a Common denominator.
- 2) Then add or subtract the numerators
- 3) Leave the denominators the same
- 4) Reduce if possible

Ex2)

Ex2) Add or Subtract. Reduce if necessary.

a)  $\frac{1 \times 5}{3 \times 5} + \frac{2 \times 3}{5 \times 3}$

$\frac{5}{15} + \frac{6}{15}$

$\frac{11}{15}$

b)  $\frac{7 \times 3}{8 \times 3} - \frac{1 \times 8}{3 \times 8}$

$\frac{21}{24} - \frac{8}{24}$

$\frac{13}{24}$

c)  $\frac{1 \times 5}{2 \times 5} + \frac{-7}{10}$

$\frac{-5}{10} + \frac{-7}{10}$

$\frac{-12}{10} \div 2 = \frac{-6}{5}$

- - add opposite  
+ +

d)  $\frac{-4 \times 3}{5 \times 3} + \frac{1 \times 5}{3 \times 5}$

$\frac{-12}{15} + \frac{5}{15}$

$\frac{-7}{15}$

**Multiplying Fractions**

- To multiply fractions,  
 1) Multiply numerators  
 2) Multiply denominators  
 3) Reduce if possible

Ex3)

Ex3) Multiply. Reduce if necessary.

a)  $\frac{3}{4} \times \frac{1}{6}$   
 $\frac{3}{24} \div 3$   
 $\frac{1}{8}$

b)  $136 \times \frac{1}{12}$   
 $\frac{136}{12} \div 4$   
 $\frac{34}{3}$

c)  $45 \times \frac{1}{2.54}$  decimal?  
 $\frac{45}{2.54} \leftarrow \left[ \begin{array}{c} \div \\ \div \end{array} \right]$   
 $= 17.72$

**Dividing Fractions**

- To divide fractions,  
 1) Change to a multiplication by **FLIPPING** the second fraction  
 2) Multiply numerators and denominators  
 3) Reduce if possible

Ex4)

Ex4) Divide. Reduce if necessary.

a)  $\frac{1}{3} \div \frac{1}{2}$   
 $\frac{1}{3} \times \frac{2}{1}$   
 $\frac{2}{3}$

b)  $-\frac{3}{1} \div \frac{2}{5}$   
 $-\frac{3}{1} \times \frac{5}{2}$   
 $-\frac{15}{2}$

c)  $\frac{5}{-4} \div \frac{3}{4}$   
 $-\frac{5}{4} \times \frac{4}{3}$   
 $\frac{-20}{12} \div 4$   
 $-\frac{5}{3}$

**Cross Multiplication**

- 1) To solve with Cross Multiplication, you need 1 fraction = 1 fraction.  
 2) Then multiply a**CROSS** (see example)  
 3) Solve for x (if you have a number times x, divide both sides by that number). *check ✓*

Ex5)

Ex5) Cross Multiply to solve for x (decimal answers possible!)

a)  $\frac{4}{3} \times \frac{x}{9}$   
 $4 \times 9 = 3 \times x$   
 $36 = 3x$   
 $\frac{36}{3} = \frac{3x}{3}$   
 $12 = x$

b)  $\frac{1}{2.54} \times \frac{x}{15}$   
 $15 = 2.54x$   
 $\frac{15}{2.54} = \frac{2.54x}{2.54}$   
 $5.91 = x$

c)  $\frac{39.37}{1} \times \frac{x}{16}$   
 $39.37 \times 16 = 1x$   
 $629.92 = x$   
 ↑  
 already  
 "one x" - alone ☺

**Reflection:** What type of fraction question do you think you could explain to someone else? What type of fraction question would you like to have some explain to you?

1.D. - Fractions Review WORKSHEET

Name: Key  
Date: \_\_\_\_\_

\*Show all work and circle answer\*

1. Reduce (put into lowest terms) if possible.

a)  $\frac{3}{6} \div 3$     b)  $\frac{16}{20} \div 4$     c)  $\frac{3}{4}$     d)  $\frac{21}{49} \div 7$     e)  $\frac{15}{9} \div 3$     f)  $\frac{-6}{30} \div 6$     g)  $\frac{1}{8}$     h)  $\frac{30}{75} \div 15$

$\frac{1}{2}$      $\frac{4}{5}$      $\frac{3}{4}$      $\frac{-3}{7}$      $\frac{5}{3}$      $\frac{-1}{5}$      $\frac{1}{8}$      $\frac{2}{5}$

2. Add or subtract and then reduce (if necessary).

a)  $\frac{2}{3} - \frac{1}{3}$     b)  $\frac{3}{4} + \frac{1}{4}$     c)  $\frac{1}{10} + \frac{2}{5} \times 2$     d)  $\frac{5}{8} - \frac{1}{4} \times 2$     e)  $\frac{-5}{6} + \frac{2}{3} \times 2$     f)  $\frac{3}{8} + \frac{1}{3} \times 8$     g)  $\frac{4}{5} - \frac{2}{3} \times 5$

$\frac{1}{3}$      $\frac{4}{4} = 1$      $\frac{1}{10} + \frac{4}{10}$      $\frac{5}{8} - \frac{2}{8}$      $\frac{-5}{6} + \frac{4}{6}$      $\frac{9}{24} + \frac{8}{24}$      $\frac{12}{15} - \frac{10}{15}$

$\frac{5}{10}$      $\frac{3}{8}$      $\frac{-1}{6}$      $\frac{17}{24}$      $\frac{2}{15}$

$\frac{1}{2}$

3. Multiply and then reduce (if necessary).

a)  $\frac{1}{6} \times \frac{4}{5}$     b)  $\frac{4}{39} \times \frac{3}{4}$     c)  $\frac{3}{8} \times \frac{3}{7}$     d)  $\frac{-2}{5} \times \frac{3}{2}$     e)  $\frac{5}{-2} \times \frac{1}{-3}$     f)  $\frac{6}{5} \times \frac{3}{2}$

$\frac{4}{30} \div 2$      $\frac{-12}{36} \div 12$      $\frac{9}{8}$      $\frac{-6}{10} \div 2$      $\frac{5}{6}$      $\frac{18}{10} \div 2$

$\frac{2}{15}$      $\frac{-1}{3}$      $\frac{-3}{5}$      $\frac{9}{5}$

4. Divide and then reduce (if necessary).

a)  $\frac{1}{3} \times \frac{15}{2}$     b)  $\frac{9}{10} \times \frac{15}{2}$     c)  $\frac{-2}{1} \times \frac{15}{5}$     d)  $\frac{4}{5} \times \frac{15}{3}$     e)  $\frac{11}{14} \times \frac{15}{6}$

$\frac{1}{3} \times \frac{2}{1}$      $\frac{9}{10} \times \frac{-2}{1}$      $\frac{-2}{1} \times \frac{5}{4}$      $\frac{4}{5} \times \frac{3}{2}$      $\frac{1}{4} \times \frac{6}{1}$

$\frac{2}{3}$      $\frac{-18}{10} \div 2$      $\frac{-10}{4} \div 2$      $\frac{12}{10} \div 2$      $\frac{6}{4} \div 2$

$\frac{-9}{5}$      $\frac{-5}{2}$      $\frac{6}{5}$      $\frac{3}{2}$

5. Solving with Cross Multiplication (need 1 fraction = 1 fraction). Decimal answers possible.

a)  $\frac{6}{5} \times \frac{x}{10}$     b)  $\frac{1}{12} \times \frac{16}{x}$     c)  $\frac{1760}{1} \times \frac{y}{6.4}$     d)  $\frac{3.28}{1} \times \frac{6}{x}$

$6 \times 10$      $1 \times = 12 \times 16$      $1y = 1760 \times 6.4$      $3.28x = 6$

$\frac{60}{5} = \frac{5x}{5}$      $x = 192$      $y = 11264$      $\frac{3.28}{3.28} = \frac{6}{3.28}$

$x = 12$      $x = 1.83$



## EQUATIONS REVIEW

Name: Key

Date: \_\_\_\_\_

ONE STEP EQUATIONS  
SHOW ALL WORK

- 1) What is happening to the variable?
- 2) What is the opposite of that?
- 3) Do the opposite to both sides of the equation.

Solve

$$1 \quad x + 19 = 53$$

$$\begin{array}{r} -19 \quad | \quad -19 \\ \hline x = 34 \end{array}$$

$$2 \quad x - 4 = 32$$

$$\begin{array}{r} +4 \quad | \quad +4 \\ \hline x = 36 \end{array}$$

$$3 \quad 8 + x = 13$$

$$\begin{array}{r} -8 \quad | \quad -8 \\ \hline x = 5 \end{array}$$

$$4 \quad \frac{19x}{19} = \frac{38}{19}$$

$$\begin{array}{r} | \quad | \\ \hline x = 2 \end{array}$$

$$5 \quad \frac{96}{4} = \frac{4x}{4}$$

$$\begin{array}{r} | \quad | \\ \hline 24 = x \end{array}$$

$$6 \quad \frac{x}{17} = 3$$

$$\begin{array}{r} (17) \frac{x}{17} = 3(17) \\ \hline x = 51 \end{array}$$

$$7 \quad \frac{1.2x}{1.2} = \frac{2.4}{1.2}$$

$$\begin{array}{r} | \quad | \\ \hline x = 2 \end{array}$$

$$8 \quad 96 = 3 + x$$

$$\begin{array}{r} -3 \quad | \quad -3 \\ \hline 93 = x \end{array}$$

$$9 \quad (4.5) 2.2 = \frac{x(4.5)}{4.5}$$

$$\begin{array}{r} | \quad | \\ \hline 9.9 = x \end{array}$$

**TWO STEP EQUATIONS**  
**SHOW ALL WORK**

- 1) What two things are happening to the variable?
- 2) Do the add/subtract step first by doing the opposite to both sides.
- 3) Then do the mult/divide step by doing the opposite to both sides.

Solve.

$$10 \quad 5x + 3 = 23$$

$$\begin{array}{r} -3 \quad -3 \\ \hline 5x = 20 \\ \hline \frac{5}{5} \quad \frac{5}{5} \\ \hline x = 4 \end{array}$$

$$11 \quad 14 = 2y - 4$$

$$\begin{array}{r} +4 \quad +4 \\ \hline 18 = 2y \\ \hline \frac{18}{2} = \frac{2y}{2} \\ \hline 9 = y \end{array}$$

$$12 \quad \overset{\text{rearrange}}{+8 - x} = 14$$

$$\begin{array}{r} -x + 8 = 14 \\ \hline \frac{-x + 8}{-8} = \frac{14}{-8} \\ \hline -x = 6 \\ \hline \frac{-x}{-1} = \frac{6}{-1} \\ \hline x = -6 \end{array}$$

$$13 \quad 2 + \frac{x}{3} = 12$$

$$\begin{array}{r} -2 \quad -2 \\ \hline \frac{x}{3} = 10 \\ \hline \frac{(3)x}{3} = 10(3) \\ \hline x = 30 \end{array}$$

$$14 \quad 3 = \frac{y}{5} - 2$$

$$\begin{array}{r} +2 \quad +2 \\ \hline 5 = \frac{y}{5} \\ \hline (5)5 = \frac{y(5)}{5} \\ \hline 25 = y \end{array}$$

$$15 \quad \frac{w}{10} + 2 = 5$$

$$\begin{array}{r} -2 \quad -2 \\ \hline \frac{w}{10} = 3 \\ \hline (10)\frac{w}{10} = 3(10) \\ \hline w = 30 \end{array}$$

$$16 \quad 3m + 2 = 14$$

$$\begin{array}{r} -2 \quad -2 \\ \hline 3m = 12 \\ \hline \frac{3}{3}m = \frac{12}{3} \\ \hline m = 4 \end{array}$$

$$17 \quad \frac{x}{2} - 4 = 3$$

$$\begin{array}{r} +4 \quad +4 \\ \hline \frac{x}{2} = 7 \\ \hline (2)\frac{x}{2} = 7(2) \\ \hline x = 14 \end{array}$$

$$18 \quad -2 + 1.5m = 10$$

$$\begin{array}{r} +2 \quad +2 \\ \hline 1.5m = 12 \\ \hline \frac{1.5}{1.5}m = \frac{12}{1.5} \\ \hline m = 8 \end{array}$$

## CROSS MULTIPLY

- 1) Make a cross.
- 2) Multiply the pair, divide the spare.

Solve by using cross multiply (round to the nearest tenth, if necessary)

19  $\frac{2}{7} \times \frac{6}{x}$

$$\frac{2x}{2} = \frac{42}{2}$$

$$x = 21$$

20  $\frac{14}{x} \times \frac{7}{3}$

$$\frac{7x}{7} = \frac{42}{7}$$

$$x = 6$$

21  $\frac{x}{5} \times \frac{12}{20}$

$$\frac{20x}{20} = \frac{60}{20}$$

$$x = 3$$

## MULTI-STEP EQUATIONS SHOW ALL WORK

- 1) Expand any brackets (distributive property).
- 2) Collect like terms on each side.
- 3) Get the variable to only one side
- 4) What two things are happening to the variable?
- 5) Do the add/subtract step first by doing the opposite to both sides.
- 6) Then do the mult/divide step by doing the opposite to both sides.

25  $3x + 5 = 5x - 7$

$$\begin{array}{r} -5x \\ -2x + 5 = -7 \\ \hline -3x = -12 \\ \div -3 \end{array}$$

$$x = 6$$

26  $-x + 4 = -4x - 8$

$$\begin{array}{r} +4x \\ 3x + 4 = -8 \\ \hline -4 \\ -4 \\ \hline 3x = -12 \\ \div 3 \end{array}$$

$$x = -4$$

27  $-4(x - 5) = x + 6 - 4x$

$$\begin{array}{r} -4x + 20 = -3x + 6 \\ +3x \\ -x + 20 = 6 \\ -20 \\ -x = -14 \\ \div -1 \end{array}$$

$$x = 14$$

28  $-(2x + 3) = 5(3 - x)$

$$\begin{array}{r} -2x - 3 = 15 - 5x \\ +5x \\ 3x - 3 = 15 \\ +3 \\ 3x = 18 \\ \div 3 \end{array}$$

$$x = 6$$

$$29 \quad 3(x-2) + 4x = -2(x-6)$$

$$\underline{3x} - 6 + \underline{4x} = -2x + 12$$

$$7x - 6 = -2x + 12$$

$$+2x \quad +2x$$

$$9x - 6 = 12$$

$$+6 \quad +6$$

$$\underline{9x} = \underline{18}$$

$$x = 2$$

$$30 \quad 12 = \frac{3x}{2}$$

$$(2)12 = \frac{3x(2)}{2}$$

$$\frac{24}{3} = \frac{3x}{3}$$

$$8 = x$$

$$31 \quad \frac{-7x}{2} + 18 = 4$$

$$-18 \quad -18$$

$$\frac{-7x(2)}{2} = -14(2)$$

$$\frac{-7x}{-7} = \frac{-28}{-7}$$

$$x = 4$$

$$32 \quad 2p^2 + 5 = 37$$

$$-5 \quad -5$$

$$\underline{2p^2} = \underline{\frac{32}{2}}$$

$$p^2 = 16$$

$$\sqrt{p^2} = \pm \sqrt{16}$$

$$p = 4, -4$$

$$33 \quad 17 = 5 + 3(x-1)$$

$$17 = \underline{5} + 3x - \underline{3}$$

$$17 = 3x + 2$$

$$-2 \quad -2$$

$$\frac{15}{3} = \frac{3x}{3}$$

$$5 = x$$